



USER'S MANUAL

Simulating the Impact of Macro Shocks Policy on Labor
markets and Employment
SIMPLE Model World Bank PREMPR

The World Bank – Poverty Reduction Group

July, 2009

Revision Sheet

Release No.	Date	Revision Description
Rev. 0	7/8/09	User's Manual Reviewed by project manager



User's Manual Authorization Memorandum

We fully accept the changes as needed improvements and authorize initiation of work to proceed. Based on our authority and judgment, the continued operation of this system is authorized.

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USER'S MANUAL

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1.0 GENERAL INFORMATION

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1.1 System Overview

1.1.1 Background

Employment and earnings are widely recognized as important channels through which economic shocks and policy reforms affect economic growth and household welfare. However, when simulating the potential impact of their occurrence, most models take very simplified view of the labor market under the common underlying assumption of a single perfectly competitive labor market.

Empirical evidence suggests that this hypothesis reflects poorly the complexity of the labor market in developing countries. Rather it may be better understood under a multi-sector framework, where (i) a ‘modern’ or ‘productive’ sector coexists with a ‘traditional’, low-paying urban sector, and a subsistence agricultural sector; and (ii) most of the working population is employed in the last two sectors, either as a result of choice or as a result of exclusion.

In this context movements of workers from the low productivity sectors to the high productivity ones -which is most commonly referred to as structural change in the development literature- are at the core of growth and poverty reduction. In addition, movement between sectors is often limited and unemployment is a ‘luxury’, thus being more prevalent among workers in the middle class than among those in the poor one.

The Lack of structural models, specifically for developing countries, has hampered our understanding of the impact of economic shocks and economic policy on labor allocation and on earnings. As the first step in remedying this knowledge gap, PREMPR has developed a theoretical model that characterizes better the nature of multi-sector labor markets in developing countries (See Albrecht, et al. 2008).

The SIMPLE software –Simulating the Impact of Macroeconomics shocks and Policy on Labor markets and Employment- is an attempt to operationalize this theoretical model by allowing users to calibrate the model to country specificities and conduct simulations of economic policies and economic shocks not only on cross-sector labor allocation, but also on earnings. Country calibrations can be done using summary statistics from household surveys. But benchmark parameters from a lower middle income country (Nicaragua) are also provided.

This first version of the model is designed to simulate economic shocks in economies where labor regulations (minimum wages, payroll taxes, severance pay, firing and hiring restrictions) are not important; either because they are set at non-binding levels or because of low compliance and enforcement. By the end of 2009, we hope to release the second version which will be suited for more regulated economies; additionally, it will be designed to simulate the impact of policy reforms on earnings and employment in any economy.

Below we describe briefly the main features of the model and how to use the SIMPLE software. Before getting into the detail, it is important to highlight that the model is specifically designed

to address issues in labor market, and results from any particular simulation should be interpreted with the given assumptions in the model (Reference Albrecht et.al. 2008, Gutierrez et.al. 2009). We recommend users to perform robustness checks for any simulation. That is, from the baseline simulation it is important to understand how much the results change if the calibrated parameters change slightly. For example, if one particular simulation shows that a 1% reduction in total factor productivity in the formal sector generates a loss of 10% in formal employment, we recommend users to check how much this result changes if, for example, income from informal employment is reduced by x%; or if the rate of arrival of shocks to the economy is 1-5% higher or lower than the calibrated value. Gutierrez et.al. (2009) may be an example of the use of model to understand the impact of the financial crisis on Indonesia.

1.1.2 The Model

The SIMPLE model is a model of search and matching as in Mortenssen and Pissarides (1994) and Pissarides (2000) while incorporating a multi-sector nature of labor markets. The model follows closely Albrecht et.al. (2008) and Satchi and temple (2006).

At any given time workers can be in any of three states unemployed, employed in agriculture, employed in the urban informal sector or employed in the urban formal sector. Below we will describe the main features of the model. Readers who are interested in elements of model further in detail are referred to Albrecht et.al. (2008).

Workers engaged in agricultural production receive the average product of labor. They can migrate to urban area and search for employment opportunities at a cost. Upon migration, they start off as unemployed. The urban sector is composed of a high productivity wage sector and a low productivity sector. In the low productivity sector, workers receive a fixed income regardless of their skills. Unemployed workers can search for either formal jobs, informal jobs or both. Informal employment opportunities arrive at a given exogenous rate. Formal rate is, however, determined through the matching function that depends on the ratio of available vacancies and unemployed workers or the measure of market tightness.

Workers differ in skills, and skills determine the maximum level of productivity in formal jobs; high skill workers can produce more outputs. Firms post vacancies at a cost and unemployed workers look for jobs, but there are frictions in the labor market in that it takes time for workers to find jobs and for firms to fill vacancies. Once workers and firms meet they bargain on a wage. Economy can face two types of shocks; idiosyncratic shocks that hit on individual worker-firm (job) match, and sector specific shocks that affect all the jobs in a given sector. Figure 1 below illustrates the structure of the labor market.

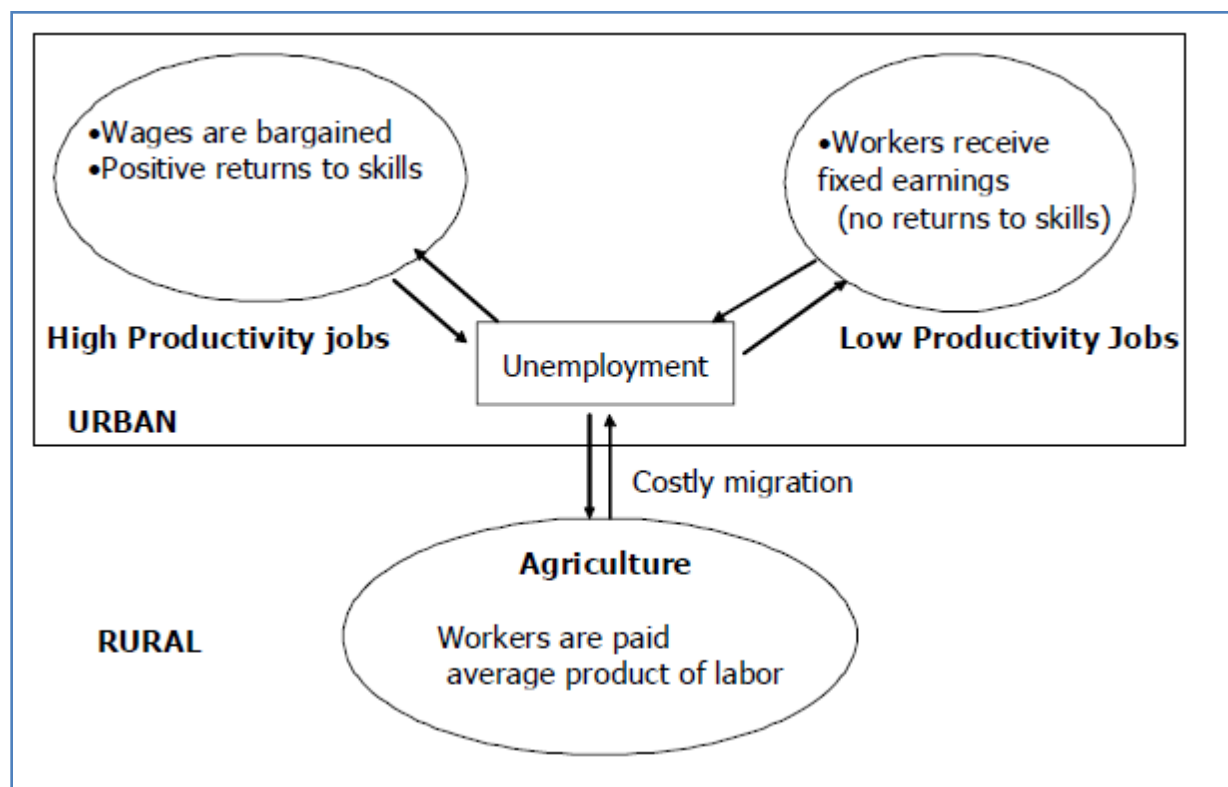


Figure 1: Structure of the Labor Market

The labor market in the model is segmented by skills, where low skill workers are located in agriculture, and high skill ones in the urban sector. In the urban sector relatively low skill workers search only for informal jobs while workers within middle range of skill can search for both formal and informal opportunities. Finally, relatively high skill workers search only for formal jobs.

The size of each sector and the number of workers searching in each market is determined by the exogenous parameters of the model: the distribution of skills, the rate of arrival of shocks, the rate of arrival of informal sector opportunities, migration costs and the technological parameters of the production functions and matching functions.

In what follows we will describe the parameters of the model in more detail, the calibration strategy and the results.

1.1.3 Model's Inputs

The first step is to assign workers into one of those sectors or the unemployment state. The following list gives specific examples of the classification.

	Nicaragua	Indonesia	Mexico definition 1	Mexico definition 2
Good jobs sector (Sector 1)	Non agricultural Formal wage employment	All wage non-agricultural workers	All formal workers (i.e. with some insurance coverage) in non agriculture	All workers in firms with more than 5 employees and self employed workers with more than secondary education)
Bad jobs sector (Sector 2)	All informal wage workers and all self-employed workers that do not hire permanent workers outside of the family members	All self employed workers that do not employ permanent workers (other than family members)	All informal workers (i.e. with no health insurance coverage)	All workers in firms of 5 or less employees and self employed workers with less than or equal to secondary education.
Rural Agriculture (Sector 3)	All agricultural workers other than employers	All agricultural workers other than employers	All agricultural workers other than employers	All agricultural workers other than employers
Unemployed	Broad unemployment definition (i.e. including discouraged workers)	Narrow definition of unemployment (i.e. only those actively searching during the period of reference)	Narrow definition of unemployment (i.e. only those actively searching during the period of reference)	Narrow definition of unemployment (i.e. only those actively searching during the period of reference)

Each worker should be assigned to one and only one sector, but not all workers or working age individuals belong to one sector or state. The model does not take into account those out of the labor force. Three of the examples above (Nicaragua, Indonesia and Mexico definition 1) leave employers with permanent workers outside of the model. The rationale for doing this is that in these countries employers with permanent workers account for less than 5% of all the employed and they are best thought of as firms, rather than workers.

Once the definition of sectors is chosen and workers are assorted accordingly, the model can be calibrated using two different strategies. The first strategy is to be used when data on the duration of employment is available. This data can be obtained when the household or labor force surveys ask for the duration of current job.

The second strategy should be used when no such data is available. In this case the average duration of unemployment is needed. Most surveys tend to ask how long the unemployed have been searching for a job. From this question it is possible to calculate the average duration of unemployment. If unemployment duration is used, it should be calculated for the same workers that are classified as unemployed. In other words if the unemployed are those only actively searching, then duration data should correspond only to duration of search.

If the unemployed include the discouraged or those temporarily inactive, then duration statistics should also include the span during which discouraged workers or temporarily inactive workers have been without a job. Many surveys tend to ask how long the unemployed have been without a job. From the response of that question, unemployment spell for the discouraged and temporarily inactive can be calculated. Below we describe the data needed for each of the calibration strategies.

Data requirement for calibrating the model

Data requirements for strategy based on employment duration:

- Average duration of employment in the bad jobs
- Average duration of employment in the good jobs
- Share of 'active' working age population employed in agriculture
- Share of 'active' working age population employed in the bad jobs sector
- Share of 'active' working age population employed in the good jobs sector
- Share of 'active' working age population unemployed
- Average earnings (income from labor) in the bad jobs sector
- Average earnings (income from labor) in the good jobs sector
- Average earnings (income from labor) in agriculture
- The mean and variance of the years of education,
- The maximum level of education found in the survey or/and the average level of education of the 1% most educated workers.
- The elasticity of labor in the agricultural production function ($dY/dE \cdot E/Y$). This elasticity can be estimated using time series data on agricultural output and total employment in agriculture. This data may be available from FAO statistics, or alternatively if it can be obtained from any study that has estimates for this elasticity.
- It is recommended that outliers be eliminated before doing the computation for average earnings.

Data requirements for strategy based on unemployment duration

- Average duration of unemployment
- Share of 'active' working age population employed in agriculture
- Share of 'active' working age population employed in the bad jobs sector

- Share of ‘active’ working age population employed in the good jobs sector
- Share of ‘active’ working age population unemployed
- Average earnings (income from labor) in the bad jobs sector
- Average earnings (income from labor) in the good jobs sector
- Average earnings (income from labor) in agriculture
- The mean and variance of years of education,
- The maximum level of education found in the survey or/and the average level of education of the 1% most educated workers.
- The elasticity of labor in the agricultural production function ($dY/dE \cdot E/Y$). This elasticity can be estimated using time series data on agricultural output and total employment in agriculture. This data may be available from FAO statistics, or alternatively if it can be obtained from any study that has estimates for this elasticity.
- It is recommended that outliers be eliminated before doing the computation for average earnings.

Information needed for the simulation steps

To simulate the impact of the financial crisis on earnings, employment and the labor allocation across sectors, we may embody a range of possible scenarios with the directional changes in model parameters.

1.2 Project References

Albrecht, J., Navarro, L., and Vroman, S. (2008) “The effects of labor market policies in an economy with informal sector” Forthcoming Economic Journal.

Albrecht, J, Gutierrez, C., Paci, P., and Park, B. (2008) Quantifying the Impact of the Financial Crisis on Employment and Wages in a Multi-sector Labor Market. Mimeo world Bank

Gutierrez C., Paci P. and Park, B. (2009) “Simulating the impact of the financial crisis on Indonesia’s labor market” mimeo World Bank

Mortensen and Pissarides (1994). Technological Progress, Job Creation and Job Destruction. Review of Economic Dynamics. 1: 733-753.

Pissarides, C. (2000). Equilibrium Unemployment Theory. Cambridge, MIT Press

Satchi M., and Temple, J. (2006). “Growth and labour markets in developing countries” Discussion Paper Series No. 5515, CEPR.

1.3 Points of Contact

1.3.1 Information

The software is a property of the World Bank Group, Poverty Reduction Division and was developed and engineering internally within the division. The project was managed by Dr. Pierella Paci (Lead Economist) and Dr. Catalina Gutierrez (E.T Consultant).

1.4.3 Help Desk

Help Desk Assistance:

Mr. Anasse Bari

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Mr. Beom .Park

Email Address: beom.sock.park@gmail.com

2.0 SYSTEM SUMMARY

2.0 SYSTEM SUMMARY

The purpose of this software is simulating the impact of Macro shocks and policy on labor markets and employment. The software provides options for two different calibrations strategies.

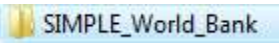
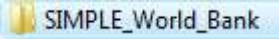
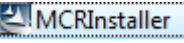
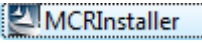
In calibration strategy type 1, the data can be obtained when the household or labor forces survey asks questions such as: how long have you been employed in the current job?

Calibration strategy type 2 should be used when no much data is available. In this case the average duration of unemployment is needed.

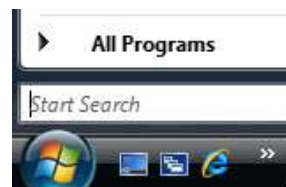
1.1 System Installation and Configuration

To install the system please follow the following steps:

A. Copy files:

1. Copy the file  to your C:\ drive.
2. Open the  and double click on .
3. Follow the steps and finish installation of the .

4. Click  start in your computer ,
cmd

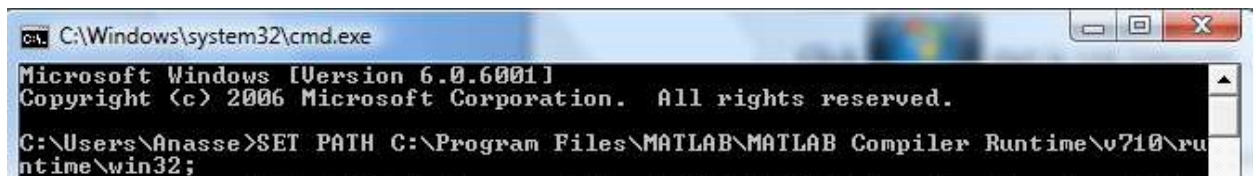


on the start search type :

B. Setting the path

5. On the command line window type the following:
SET PATH C:\Program Files\MATLAB\MATLAB Compiler Runtime\v710\runtime\win32;

As follows:



Setting the path can be done alternatively as follows:

Alternately, for Windows, add the following pathname:

C:\Program Files\MATLAB\MATLAB Compiler Runtime\v710\runtime\win32;

to the PATH environment variable, by doing the following:

1. Select the My Computer icon on your desktop.
2. Right-click the icon and select Properties from the menu.
3. Select the Advanced tab.
4. Click Environment Variables.

5.on variable path add
C:\Program Files\MATLAB\MATLAB Compiler Runtime\v710\runtime\win32;
NOTE: On Windows, the environment variable syntax utilizes
backslashes (\), delimited by semi-colons (;).

C. Creating a short-cut on your desktop

Open  SIMPLE_World_Bank for your C drive.



Drag the file  into your desktop. [File type : short-cut]

The installation and configuration is completed

3.0 GETTING STARTED

3.0 GETTING STARTED

This section will provide a general walkthrough of the system from initial through exit.



To get started, double click on SIMPLE Model-Wor...

Then the following window appears:

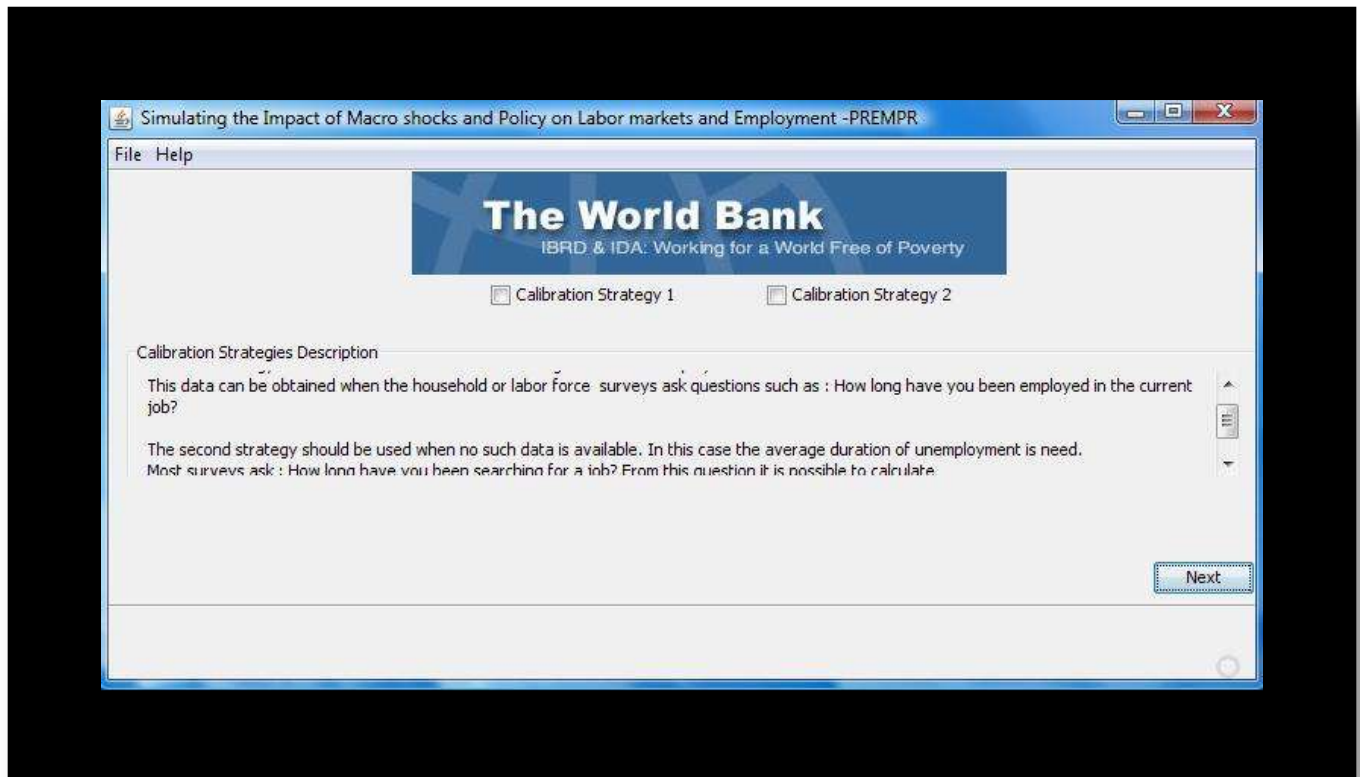


Figure.2 Main System Window

If you click on the Help, information about the system will be displayed as follow.

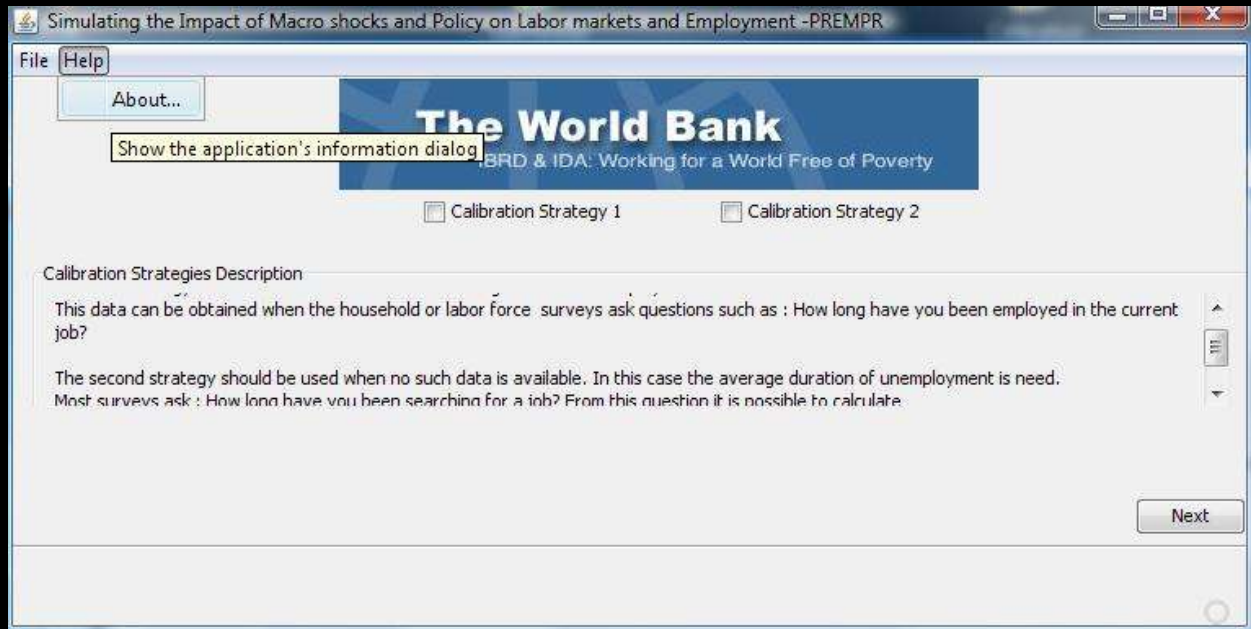


Figure.3 System Overview

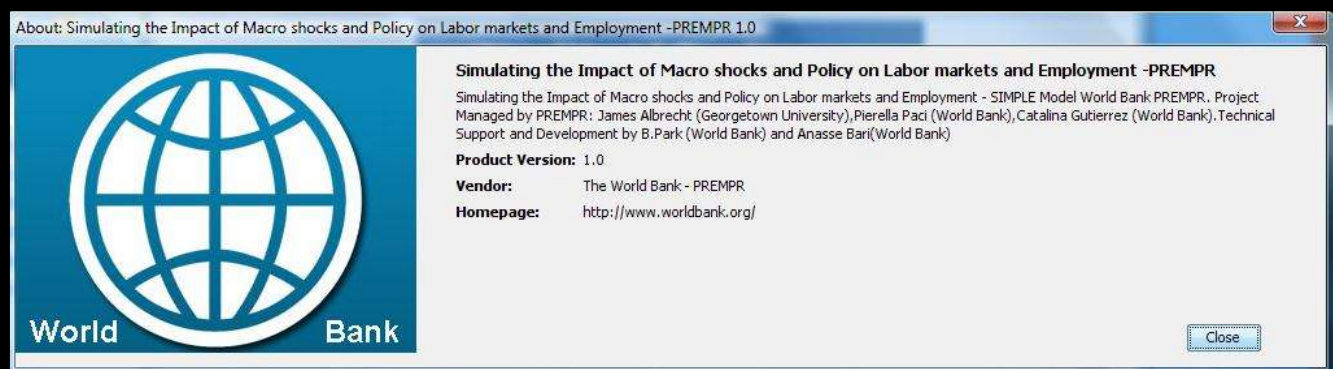


Figure.4 'About' system window

3.1 System Menu

As was mentioned in earlier sections, there are two main navigation paths to function noted on the screen: Calibration strategy 1 and Calibration strategy 2. The end user must check a calibration strategy before moving to the next system window.

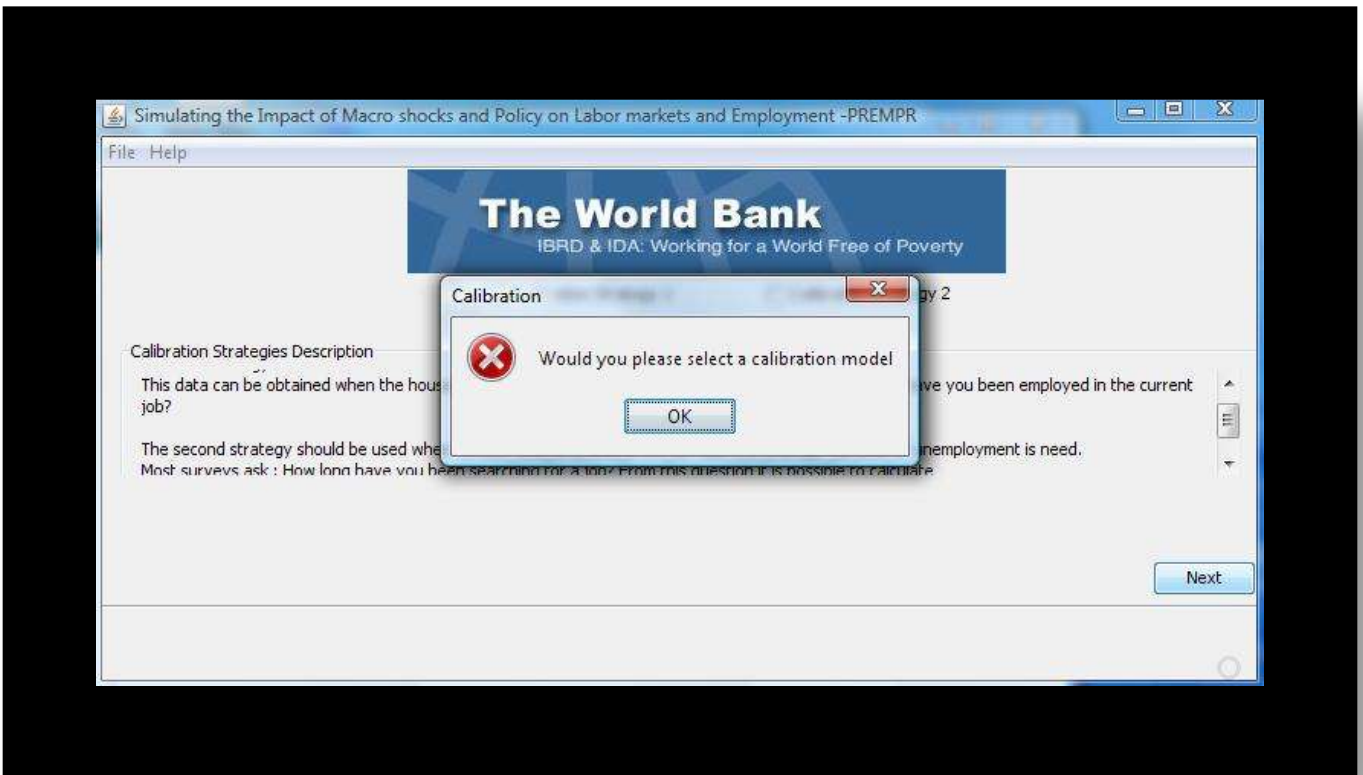


Figure.5 Error Message

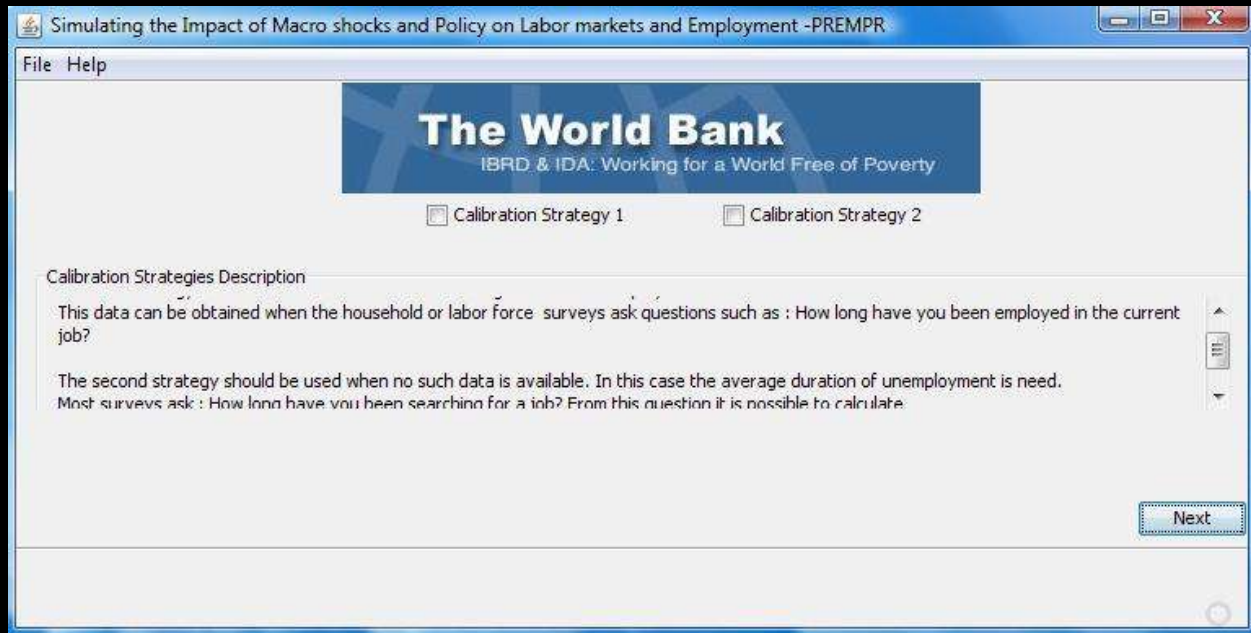


Figure.6 Select a Calibration Strategy and Press “Next”

3.2 Calibration Strategy Type 1 : Nicaragua

Once you press next the following window comes up:

Model 1 - Simulating the Impact of Macro shocks and Policy on Labor markets and Employment - SIMPLE Model World Bank PREMPS

Data Inputs

Interest Rate	0.04
Average Years of Education	5.461
Variance of Years of Education	19.6978
Maximum Years of Education	19
Bargaining Power of Workers	0.5
Income while Unemployed	0
Average Income in Informal Economy	0.9767
Duration of Informal Job	5.69
Output Elasticity of Labor in Agriculture	0.6267
Share of Workers in Agriculture	0.3067
Average Income in Agriculture	0.5391416
Average Wage in Formal Sector	1.161806
Share of Workers in Informal Sector	0.2174
Share of Workers in Formal Sector	0.3630
Duration in Formal Job	6.17

Calibration Parameters

Agricultural TFP		Migration Cost	
Formal Sector TFP		Cost of Holding a Vacancy	
Rate of Arrival of Shocks to The Formal Sector Jobs		Rate of Job Destruction in Informal Economy	
Rate of Arrival of Informal Sector Job Opportunities		Efficiency Parameters in Matching Function	
Parameter A in Scale Distribution		Parameter B in Scale Distribution	

Outcomes of Endogenous Variables

Unemployment Rate		Duration of a Formal Job	
Share of Workers in Informal Sector		Duration of an Informal Job	
Share of Workers in Formal Sector		Duration of Unemployment	
Share of Workers in Agriculture		Degree of Market Tightness	
Average Wage in Formal Sector		Vacancy Rate	
Average Income in Informal Sector		Highest Threshold Level of Education/Skills Required to Migrate	
Average Income in Agriculture		Highest Threshold Level of Education/Skills Required for a Formal Job	
Average Income in the Economy		Lowest Threshold Level of Education/Skills Required for Informal Job Search	
		Rate of Arrival if Formal Sector Job Opportunities	

Initial Values

Rate of Arrival of Informal Sector Job Opportunities	.5090	Formal Sector TFP	3.6469
Rate of Arrival of Shocks to The Formal Sector Jobs	.3026	Rate of Arrival if Formal Sector Job Opportunities	.7671

Buttons: Load Inputs for Nicaragua, New Calibration, Run Calibration for Nicaragua, Run Calibration, < Back, Reset, Next >

Figure.7 Calibration Strategy 1

Once in the Calibration window, Press “Load Inputs for Nicaragua”, sample Inputs will be displayed on the fields. The purpose is to get an idea of possible values for inputs. Nicaragua’s sample inputs were validated for calibration strategy 1. It can be used as a reference.

Two options you can choose, either you run the calibration for Nicaragua or make a new Calibration.

Option 1: Press: **‘Run Calibration for Nicaragua’** this will run the calibration for Nicaragua based on the data input displayed.

Option 2: Press: **‘New Calibration’** in this case you need to enter new inputs or modify Nicaragua inputs. Once you enter data inputs, press **‘Run Calibration’**

Once you click “**Run Calibration for Nicaragua**” the following window appears:

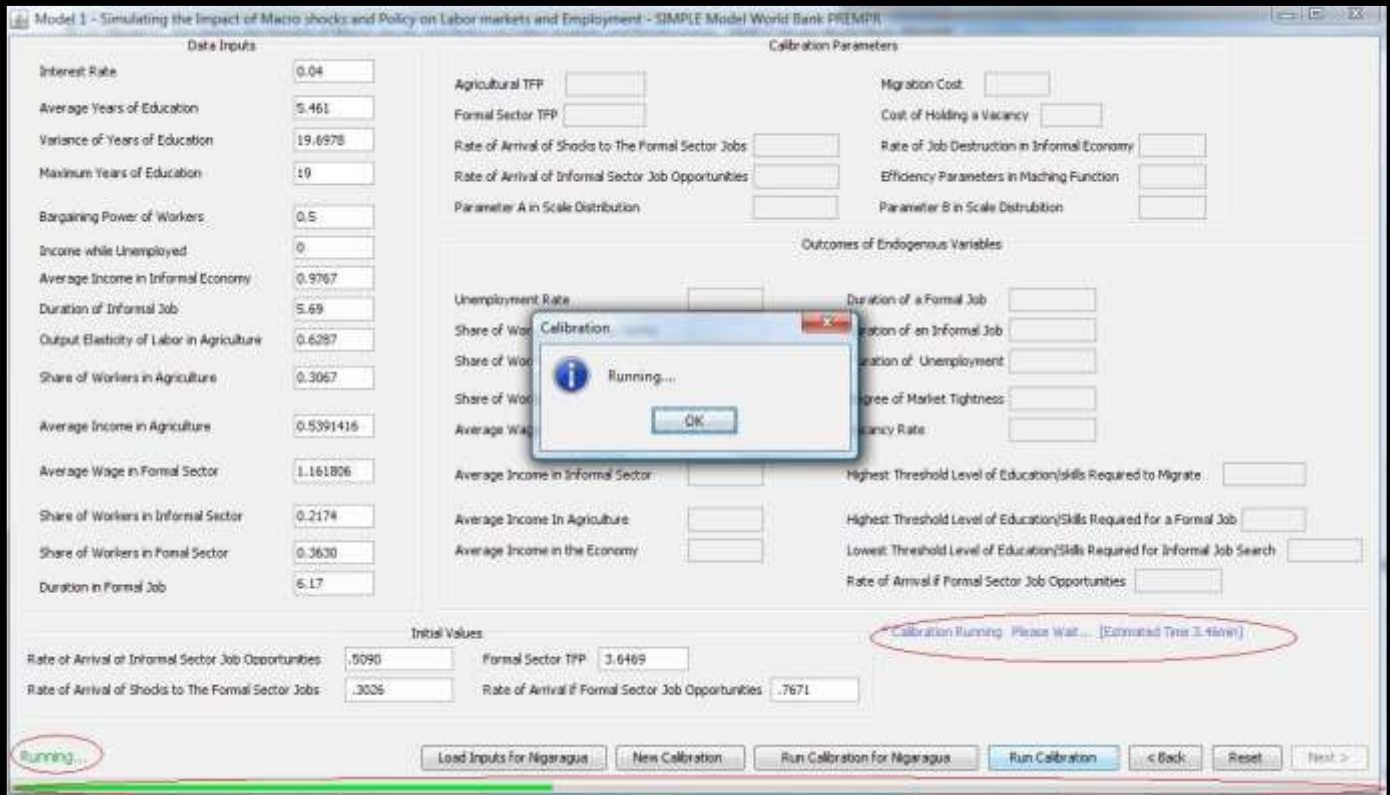


Figure.8 Running Calibration

Press “OK” when the calibration window pops up. Notice the window’s areas circulated in red. Running Label: that the label that show the process status. It will turn to “Done” when the process has finished.

System Status Messages (in blue): displays messages on the estimated time for the process and the process status.

Progress Bar: In green.

Note that the when the calibration is done, a message will be displayed. The “Running” label will be changed to “Done” and the progress bar will be all green as it shows in the following figure:

Model I - Simulating the Impact of Macro shocks and Policy on Labor markets and Employment - SIMPLE Model World Bank PREMPS

Data Inputs

Interest Rate	0.04
Average Years of Education	5.461
Variance of Years of Education	19.6978
Maximum Years of Education	19
Bargaining Power of Workers	0.5
Income while Unemployed	0
Average Income in Informal Economy	0.3067
Duration of Informal Job	5.69
Output Elasticity of Labor in Agriculture	0.6287
Share of Workers in Agriculture	0.3067
Average Income in Agriculture	0.5391416
Average Wage in Formal Sector	1.161806
Share of Workers in Informal Sector	0.2174
Share of Workers in Formal Sector	0.3630
Duration in Formal Job	6.17

Calibration Parameters

Agricultural TFP	0.34763	Migration Cost	0.1063
Formal Sector TFP	2.6451	Cost of Holding a Vacancy	2.5963
Rate of Arrival of Shocks to The Formal Sector Jobs	0.21719	Rate of Job Destruction in Informal Economy	0.17575
Rate of Arrival of Informal Sector Job Opportunities	0.42038	Efficiency Parameters in Matching Function	1
Parameter A in Scale Distribution	0.79143	Parameter B in Scale Distribution	1.9621

Outcomes of Endogenous Variables

Unemployment Rate	0.11244	Duration of a Formal Job	6.1757
Share of Workers in Informal Sector	0.21761	Duration of an Informal Job	5.69
Share of Workers in Formal Sector	0.36325	Duration of Unemployment	2.5486
Share of Workers in Agriculture	0.3067	Degree of Market Tightness	0.11702
Average Wage in Formal Sector	1.161	Vacancy Rate	1.4033
Average Income in Informal Sector	0.9767	Highest Threshold Level of Education/Skills Required to Migrate	0.24403
Average Income in Agriculture	0.53914	Highest Threshold Level of Education/Skills Required for a Formal Job	0.15778
Average Income in the Economy	0.79963	Lowest Threshold Level of Education/Skills Required for Informal Job Search	0.50822
		Rate of Arrival if Formal Sector Job Opportunities	1.1846

Initial Values

Rate of Arrival of Informal Sector Job Opportunities	.5090	Formal Sector TFP	3.6469
Rate of Arrival of Shocks to The Formal Sector Jobs	.3025	Rate of Arrival if Formal Sector Job Opportunities	.7671

* Calibration Running Please Wait... [Estimated Time 3.48min]
* Calibration Finished Press NEXT to Run Simulation

Done

Load Inputs for Nicaragua New Calibration Run Calibration for Nicaragua Run Calibration < Back Reset Next >

Figure.9 Calibration: Nicaragua

Notice that the outcomes of Endogenous variables and Calibration parameters get display on the text fields accordingly with their corresponding labels.

The second option is to run a new calibration. In this case, you need to load input for the default values for Nicaragua and modify them then press “Run Calibration”. Press “Next” to go to the next step.

3.3 Run Simulation for Nicaragua

Before launching simulation process, a calibration should have already run. When you press “Next” on calibration window, the following window comes up.

Simulation 1 - Simulating the Impact of Macro shocks and Policy on Labor markets and Employment - SIMPLE Model World Bank PREMPR

Data Inputs		Outcomes of Endogenous Variables	
Interest rate	0.04	Unemployment rate	
Average Years of Education	5.461	Share of Workers in Informal Sector	
Variance of Years of Education	19.698	Share of Workers In Formal Sector	
Maximum Years of Education	19	Share of Workers in Agriculture	
Bargaining Power of Workers	0.5	Average Wage in Formal Sector	
Income while Unemployed	0	Average Income in Informal Sector	
Average Income in Informal Economy	0.9767	Average Income In Agriculture	
Rate of Informal Job Destruction	5.69	Average Income in the Economy	
Output Elasticity of Labor in Agriculture	0.6287	Duration of a Formal Job	
Agricultural TFP	0.3067	Duration of an Informal Job	
Formal Sector TFP	0.53914	Duration of Unemployment	
Migration Cost	1.1618	Degree of Market Tightness	
Cost of Holding a Vacancy	0.2174	Vacancy Rate	
Rate of Arrival of Informal Sector Job Opp	0.363	Highest Threshold Level of Education/Skills Required to Migrate	
Matching Efficiency	6.17	Highest Threshold Level of Education/Skills Required for a Formal Job	
		Lowest Threshold Level of Education/Skills Required for Informal Job Search	
		Rate of Arrival if Formal Sector Job Opportunities	

* Modify or Enter new Input Data Inputs and Press "Run Simulation"

Load Inputs for Nicaragua New Simulation Run Simulation for Nicaragua Run Simulation < Back Reset Next >

Figure.10 Simulation

Notice that the values displayed in the data inputs are the same values used for calibration that were entered by the user. The section is about running calibration for Nicaragua, in order to that press "Run Simulation for Nicaragua".

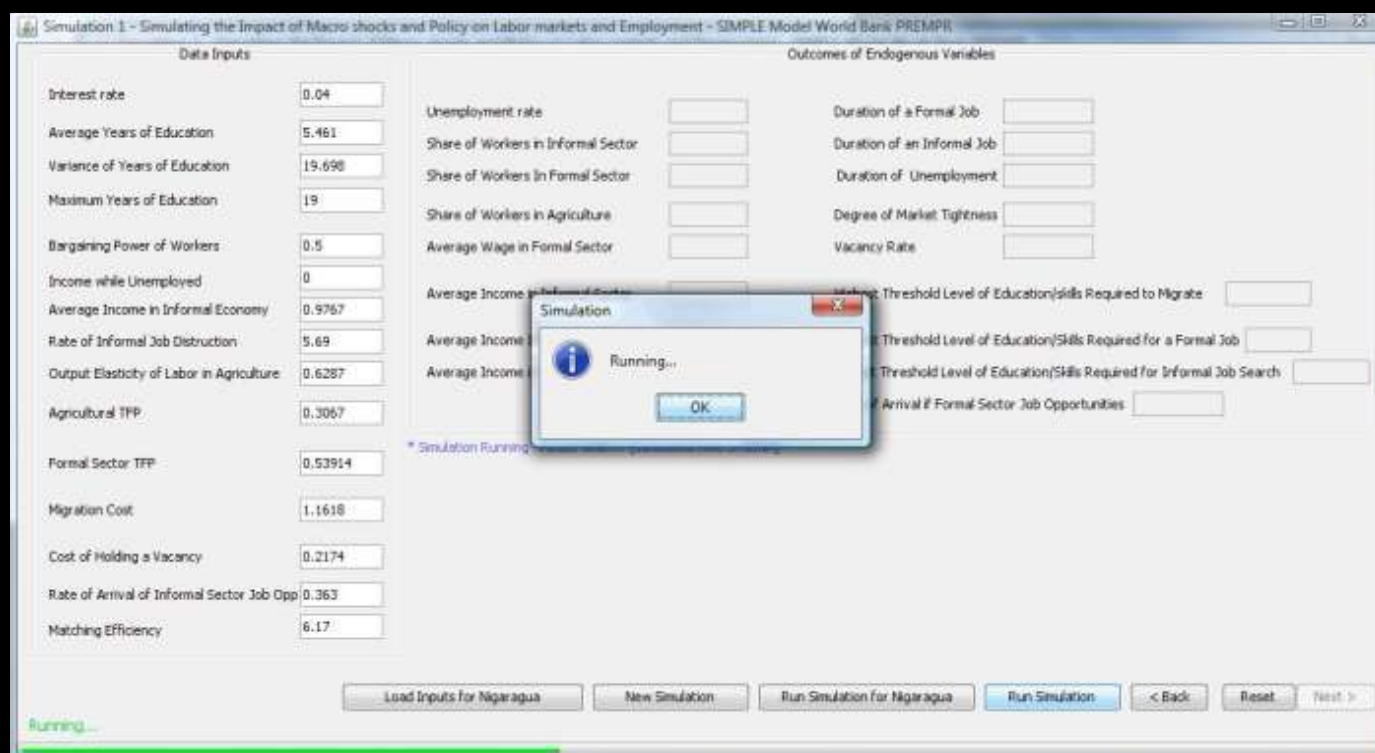


Figure.11 Launching Simulation

Press “OK”. The simulation results for Nicaragua’s case will be displayed.

Simulation 1 - Simulating the Impact of Macro shocks and Policy on Labor markets and Employment - SIMPLE Model World Bank PREMPS

Data Inputs		Outcomes of Endogenous Variables	
Interest rate	0.04	Unemployment rate	0.1129
Average Years of Education	5.461	Share of Workers in Informal Sector	0.2174
Variance of Years of Education	19.696	Share of Workers in Formal Sector	0.363
Maximum Years of Education	19	Share of Workers in Agriculture	0.3067
Bargaining Power of Workers	0.5	Average Wage in Formal Sector	1.3542
Income while Unemployed	0	Average Income in Informal Sector	0.9767
Average Income in Informal Economy	0.9767	Average Income in Agriculture	0.53914
Rate of Informal Job Destruction	5.69	Average Income in the Economy	0.86926
Output Elasticity of Labor in Agriculture	0.6267	Duration of a Formal Job	6.17
Agricultural TFP	0.3067	Duration of an Informal Job	5.6899
Formal Sector TFP	0.53914	Duration of Unemployment	2.774
Migration Cost	1.1616	Degree of Market Tightness	0.11701
Cost of Holding a Vacancy	0.2174	Vacancy Rate	0.58847
Rate of Arrival of Informal Sector Job Opp	0.363	Highest Threshold Level of Education/Skills Required to Migrate	0.18808
Matching Efficiency	6.17	Highest Threshold Level of Education/Skills Required for a Formal Job	0.066439
		Lowest Threshold Level of Education/Skills Required for Informal Job Search	0.451
		Rate of Arrival of Formal Sector Job Opportunities	0.76712

* Simulation Running / Please Wait... (Estimated Time 3.42min)
 * Simulation Finished / see above Simulation Outputs

Done.

Load Inputs for Nicaragua New Simulation Run Simulation for Nicaragua **Run Simulation** < Back Reset Next >

Figure.12 Simulation for Nicaragua Completed

3.4 Run New Calibration

On the main menu you can select calibration strategy 1 or 2 and then press next.

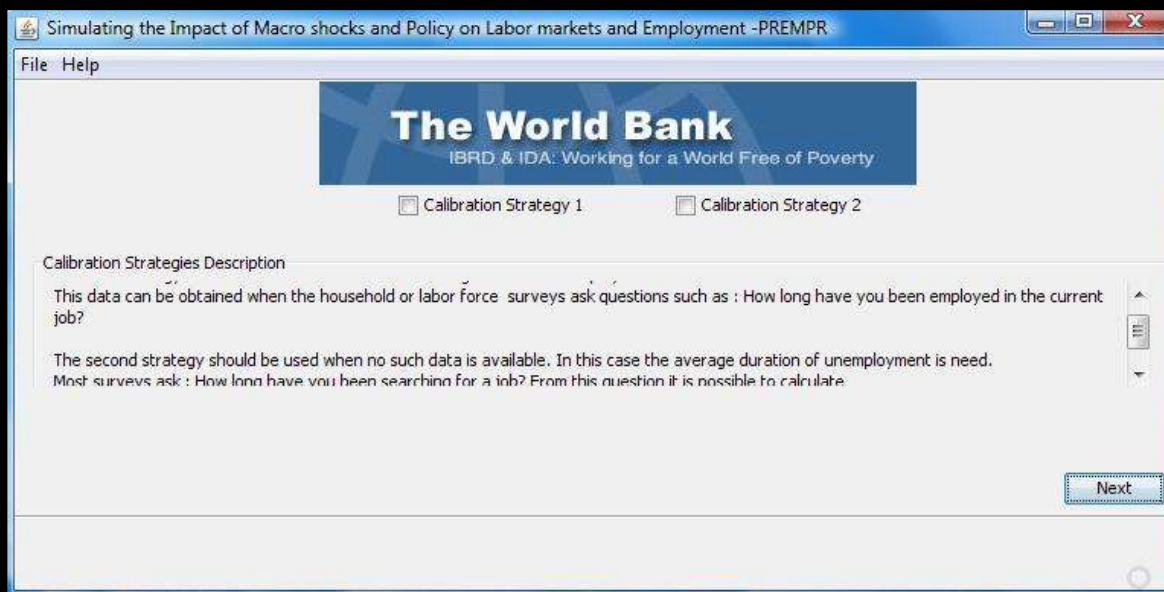


Figure.13 Select calibration

Then on the next window, press “Load Inputs for Nigragua” first, then modify or enter your new data inputs.

Model 1 - Simulating the Impact of Macro shocks and Policy on Labor markets and Employment - SIMPLE Model World Bank PREMPO

Data Inputs

Interest Rate	0.04
Average Years of Education	5.461
Variance of Years of Education	19.6978
Maximum Years of Education	19
Bargaining Power of Workers	0.5
Income while Unemployed	0
Average Income in Informal Economy	0.9767
Duration of Informal Job	5.69
Output Elasticity of Labor in Agriculture	0.6287
Share of Workers in Agriculture	0.3067
Average Income in Agriculture	0.5391416
Average Wage in Formal Sector	1.161806
Share of Workers in Informal Sector	0.2174
Share of Workers in Formal Sector	0.3630
Duration in Formal Job	6.17

Calibration Parameters

Agricultural TFP		Migration Cost	
Formal Sector TFP		Cost of Holding a Vacancy	
Rate of Arrival of Shocks to The Formal Sector Jobs		Rate of Job Destruction in Informal Economy	
Rate of Arrival of Informal Sector Job Opportunities		Efficiency Parameters in Matching Function	
Parameter A in Scale Distribution		Parameter B in Scale Distribution	

Outcomes of Endogenous Variables

Unemployment Rate		Duration of a Formal Job	
Share of Workers in Informal Sector		Duration of an Informal Job	
Share of Workers in Formal Sector		Duration of Unemployment	
Share of Workers in Agriculture		Degree of Market Tightness	
Average Wage in Formal Sector		Vacancy Rate	
Average Income in Informal Sector		Highest Threshold Level of Education/Skills Required to Migrate	
Average Income in Agriculture		Highest Threshold Level of Education/Skills Required for a Formal Job	
Average Income in the Economy		Lowest Threshold Level of Education/Skills Required for Informal Job Search	
		Rate of Arrival if Formal Sector Job Opportunities	

Initial Values

Rate of Arrival of Informal Sector Job Opportunities	.5090	Formal Sector TFP	3.6469
Rate of Arrival of Shocks to The Formal Sector Jobs	.3026	Rate of Arrival if Formal Sector Job Opportunities	.7671

* Modify or Enter new Data Inputs and Press 'Run Calibration' *

Load Inputs for Nigragua New Calibrations Run Calibration for Nigragua Run Calibration < Back Reset Next >

Figure.14 New Calibration

Notice the message in blue stating modify or enter data inputs then press Run Calibration. The average time for the calibration is between 2min16sec. However, based on your initial values this running time might change. There is a time out on process in case its response time exceeded 9min.

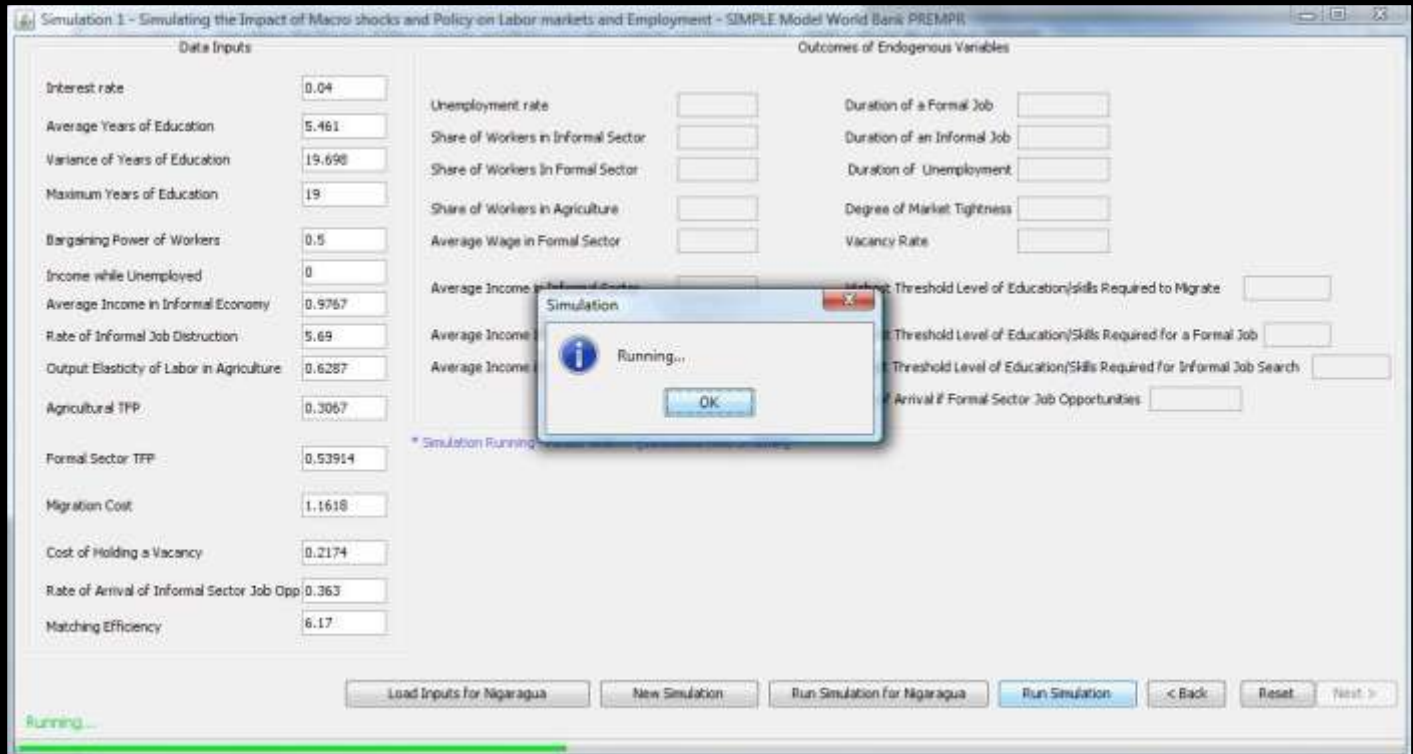


Figure.15 lunching Calibration

The calibration is being processed. You need wait until you get a blue message stating that the calibration is finished. The status bar will show the progress as well. See next figure

Simulation 1 - Simulating the Impact of Macro shocks and Policy on Labor markets and Employment - SIMPLE Model World Bank PREMPS

Data Inputs		Outcomes of Endogenous Variables	
Interest rate	0.04	Unemployment rate	0.1129
Average Years of Education	5.461	Share of Workers in Informal Sector	0.2174
Variance of Years of Education	19.698	Share of Workers in Formal Sector	0.363
Maximum Years of Education	19	Share of Workers in Agriculture	0.3067
Bargaining Power of Workers	0.5	Average Wage in Formal Sector	1.3542
Income while Unemployed	0	Average Income in Informal Sector	0.9767
Average Income in Informal Economy	0.9767	Average Income in Agriculture	0.53914
Rate of Informal Job Destruction	5.69	Average Income in the Economy	0.86926
Output Elasticity of Labor in Agriculture	0.6287	Highest Threshold Level of Education/Skills Required to Migrate	0.18808
Agricultural TFP	0.3067	Highest Threshold Level of Education/Skills Required for a Formal Job	0.066439
Formal Sector TFP	0.53914	Lowest Threshold Level of Education/Skills Required for Informal Job Search	0.451
Migration Cost	1.1618	Rate of Arrival of Formal Sector Job Opportunities	0.76712
Cost of Holding a Vacancy	0.2174		
Rate of Arrival of Informal Sector Job Opp	0.363		
Matching Efficiency	6.17		

* Simulation Running - Please Wait... (Estimated Time 3:42min)
 * Simulation Finished - see above Simulation Outputs

Done

Load Inputs for Nicaragua New Simulation Run Simulation for Nicaragua **Run Simulation** < Back Reset Next >

Figure.16 Calibration processed

Once the calibration is done, you can click on “Next” to run simulation.

3.5 Calibration and Simulation Strategy 2

Simulation 1 - Simulating the Impact of Macro shocks and Policy on Labor markets and Employment - SIMPLE Model World Bank PREMPS

Data Inputs		Outcomes of Endogenous Variables	
Interest rate	0.04	Unemployment rate	
Average Years of Education	5.461	Share of Workers in Informal Sector	
Variance of Years of Education	19.698	Share of Workers in Formal Sector	
Maximum Years of Education	19	Share of Workers in Agriculture	
Bargaining Power of Workers	0.5	Average Wage in Formal Sector	
Income while Unemployed	0	Average Income in Informal Sector	
Average Income in Informal Economy	0.9767	Average Income in Agriculture	
Rate of Informal Job Destruction	5.69	Average Income in the Economy	
Output Elasticity of Labor in Agriculture	0.6287	Duration of a Formal Job	
Agricultural TFP	0.3067	Duration of an Informal Job	
Formal Sector TFP	0.53914	Duration of Unemployment	
Migration Cost	1.1618	Degree of Market Tightness	
Cost of Holding a Vacancy	0.2174	Vacancy Rate	
Rate of Arrival of Informal Sector Job Opp	0.363	Highest Threshold Level of Education/Skills Required to Migrate	
Matching Efficiency	6.17	Highest Threshold Level of Education/Skills Required for a Formal Job	
		Lowest Threshold Level of Education/Skills Required for Informal Job Search	
		Rate of Arrival if Formal Sector Job Opportunities	

Buttons: Load Inputs for Nicaragua, New Simulation, Run Simulation for Nicaragua, Run Simulation, < Back, Reset, Next >

Figure.16. Simulation

The simulation window will display the data inputs entered at the calibration. Press “New simulation” then “Run simulation”.

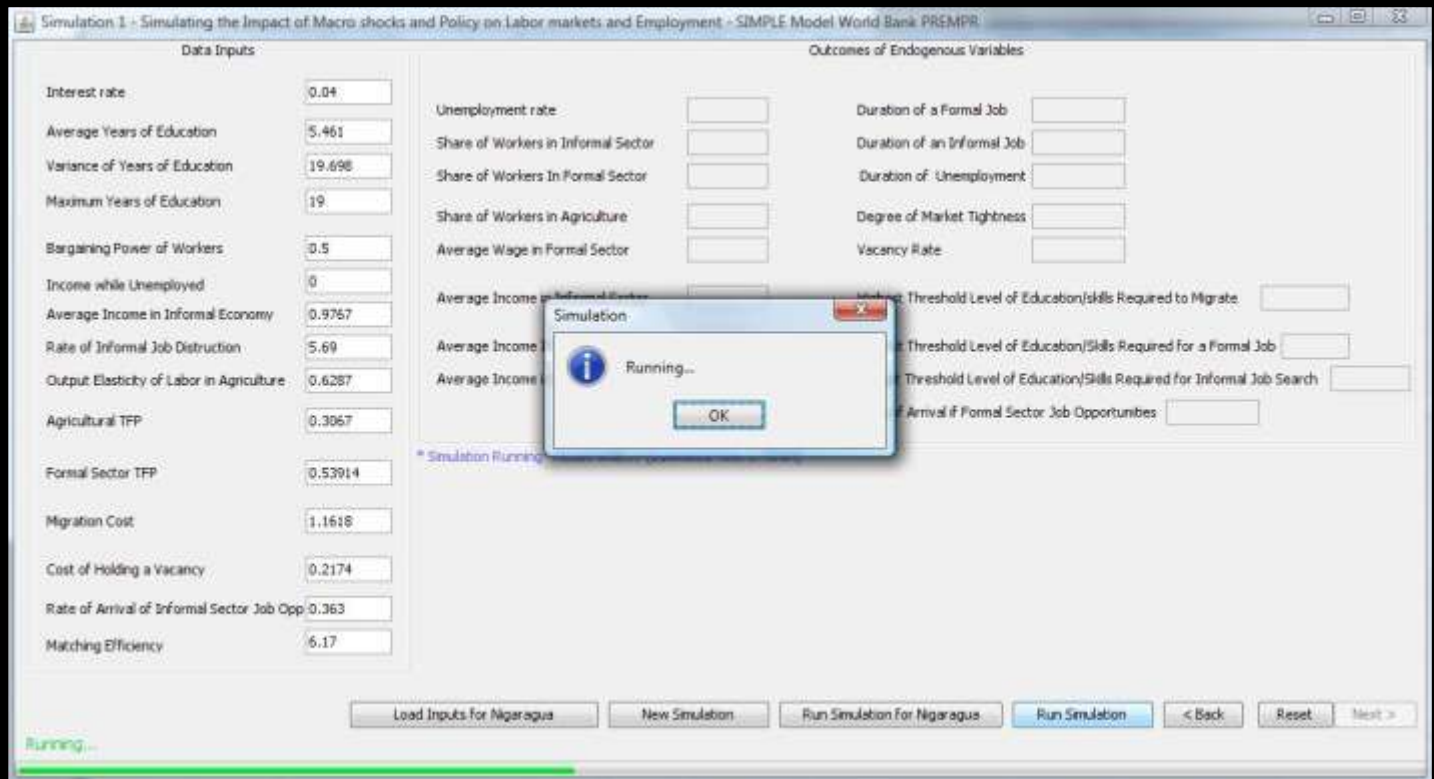


Figure.17 Launching Simulation

The average time for simulation is 2min. A notification message will be displayed when it is completed.

Simulation 1 - Simulating the Impact of Macro shocks and Policy on Labor markets and Employment - SIMPLE Model World Bank PREMPS

Data Inputs		Outcomes of Endogenous Variables	
Interest rate	0.04	Unemployment rate	0.1129
Average Years of Education	5.461	Share of Workers in Informal Sector	0.2174
Variance of Years of Education	19.696	Share of Workers in Formal Sector	0.363
Maximum Years of Education	19	Share of Workers in Agriculture	0.3067
Bargaining Power of Workers	0.5	Average Wage in Formal Sector	1.3542
Income while Unemployed	0	Average Income in Informal Sector	0.9767
Average Income in Informal Economy	0.9767	Average Income in Agriculture	0.53914
Rate of Informal Job Destruction	5.69	Average Income in the Economy	0.86926
Output Elasticity of Labor in Agriculture	0.6287		
Agricultural TFP	0.3067		
Formal Sector TFP	0.53914		
Migration Cost	1.1618		
Cost of Holding a Vacancy	0.2174		
Rate of Arrival of Informal Sector Job Opp	0.363		
Matching Efficiency	6.17		
		Duration of a Formal Job	6.17
		Duration of an Informal Job	5.8899
		Duration of Unemployment	2.774
		Degree of Market Tightness	0.11701
		Vacancy Rate	0.58847
		Highest Threshold Level of Education/Skills Required to Migrate	0.18808
		Highest Threshold Level of Education/Skills Required for a Formal Job	0.066439
		Lowest Threshold Level of Education/Skills Required for Informal Job Search	0.451
		Rate of Arrival of Formal Sector Job Opportunities	0.76712

* Simulation Running Please Wait... (Estimated Time 3.42min)
 * Simulation Finished: see above Simulation Outputs

Done.

Load Inputs for Nicaragua New Simulation Run Simulation for Nicaragua Run Simulation < Back Reset Next >

Figure.18 Simulation Completed

3.6 Run New Calibration: Strategy 2

This process is the same case [3.2.3 Run New Calibration: Strategy 1], except that the sample values are for Indonesia in type 2 rather than Nicaragua.

3.6 Caveats and Exceptions

The process for both calibration and simulation will terminate in case it exceeds 9mins. If the application process takes longer, it triggers the fact that there might be an error on the data inputs or the initial values. For more information regarding your inputs, contact help desk. [contact information provided above]

